<u>Amendments to the Claims:</u>

This listing of claims will replace all prior versions, and listings, of claims in the application:

<u>Listing of Claims:</u>

1. (currently amended) An optical coupler comprising:

at least one input waveguide, a coupling region optically connected to said input waveguide; and

a plurality of output waveguides each optically connected to said coupling region, wherein said coupling region further comprises a plurality of coupled waveguides, which, over at least part of their lengths, diverge with respect to each other in the propagation direction of electromagnetic radiation launched in the said input waveguide<u>, wherein at least some of the waveguides in the coupling region comprise a section having a width that is less than a predetermined critical width of the waveguide at a predetermined wavelength at which the coupler is designed to operate.</u>

2. (currently amended) The optical coupler according to claim 1, wherein a width of at least some of the waveguides in the coupling region increases<u> in the propagation direction</u>.

3. (original) The optical coupler according to claim 2, wherein the width of the gaps between the waveguides in the coupling region is at least substantially constant.

4. (cancelled)

5. (original) The optical coupler according to any one of claims 1, 2 and 3, wherein centre lines of at least some of the gaps between the waveguides in a coupling region follow the lines of a Gaussian field in accordance with equations E1 as follows:

$$w(z) = w_k\sqrt{1+(\alpha z)^2} \quad ; \quad \alpha = \frac{(\lambda / n_{eff})}{\pi w_o^{\,2}} \quad ; \quad R = z\left(1+\left(\frac{1}{\alpha z}\right)^2\right)$$

where z is the longitudinal propagation position; w(z) is the z-dependent lateral position of the central line of the k^{th} gap; w_k is the position of the centre of the k^{th} gap at z=0; w_o is the beam waist at z=0; λ is the wavelength in vacuum, n_{eff} is the effective index and R is the radius of curvature of the phase front.

6. (currently amended) The optical coupler according to ~~any one of~~ claim 5, wherein the equations E1 include a linearised version and ~~other mathematical~~ polynomial approximation of the equations E1.

7. (currently amended) The optical coupler according to any one of claims 1, 2 and 3, wherein the centre lines of a gap between the waveguides in the coupling region follow the lines of a field in accordance with equations E2 as follows:

$$w(z) = \begin{cases} w_k & , \quad for\ z < z_k \\ w_k\sqrt{1+[\alpha(z-z_k)]^2} & , \quad for\ z >= z_k \end{cases} \quad ; \quad \alpha = \frac{(\lambda / n_{eff})}{\pi w_o^{\,2}}$$

where z is the longitudinal propagation position; w(z) is the z-dependent lateral position of the central line of the k^{th} gap; w_k is the position of the centre of the k^{th} gap at z=0; w_o is the beam waist at z=0; λ is the wavelength in vacuum, and n_{eff} is the effective index ~~and R is the radius of curvature of the phase front~~.

8. (currently amended) The optical coupler according to ~~any one of~~ claim 7, wherein the equations E2 include a linearised version and ~~other mathematical~~ polynomial approximation of the equations E2.

9. (currently amended) The optical coupler according to any one of claims 1, 2 and 3, wherein the waveguides in the coupling region initially converge in the propagation direction and subsequently diverge.

10. (original) The optical coupler according to any one of claim 1, 2 and 3, wherein the coupler, when electromagnetic radiation of a wavelength at which the coupler is designed to operate is launched in one of the inputs, generates (an end field with) an amplitude distribution, which exhibits, in a lateral direction, a plurality of peeks and wherein (the beginning of) the output waveguides are positioned at the lateral positions of these peaks.

11. (original) The optical coupler according to claim 1, wherein the all the said waveguides are planar waveguides.

12. (currently amended) ~~The optical coupler~~Arrayed waveguide grating comprising at least one optical coupler according to claim 1 ~~according to claim 1, wherein at least one of said optical coupler is used in an arrayed waveguide grating~~.

13. (currently amended) The optical coupler according to claim 1, wherein the width of the gaps between the waveguides in the coupling region is substantially constant, in combination with gradually increasing the lateral contrast between the waveguides.

14. (original) An optical coupler comprising:

at least one input waveguide, a coupling region optically connected to said input waveguide; and

a plurality of output waveguides each optically connected to said coupling region, wherein said coupling region further comprises a plurality of coupled waveguides, at least some section of said coupled waveguides having a width that is less than a predetermined critical width at a predetermined wavelength at which said optical coupler is designed to operate, said coupled waveguides over at least another part of their lengths diverging with respect to each

other in the propagation direction of electromagnetic radiation launched in the said input waveguide.

15. (currently amended) The optical coupler according to ~~any one of~~ claim 14, wherein centre lines of at least some of the gaps between the waveguides in a coupling region follow the lines of a Gaussian field in accordance with equations E1 as follows:

$$w(z) = w_k\sqrt{1+(\alpha z)^2} \quad ; \quad \alpha = \frac{(\lambda / n_{eff})}{\pi w_o^{\ 2}} \quad ; \quad R = z\left(1+\left(\frac{1}{\alpha z}\right)^2\right)$$

where z is the longitudinal propagation position; w(z) is the z-dependent lateral position of the central line of the k^{th} gap; w_k is the position of the centre of the k^{th} gap at z=0; w_o is the beam waist at z=0; λ is the wavelength in vacuum, n_{eff} is the effective index and R is the radius of curvature of the phase front.

16. (currently amended) The optical coupler according to ~~any one of~~ claim 15, wherein the equations E1 include a linearised version and ~~other mathematical~~ polynomial approximation of the equations E1.

17. (currently amended) The optical coupler according to ~~any one of~~ claim 14, wherein the centre lines of a gap between the waveguides in the coupling region follow the lines of a field in accordance with equations E2 as follows:

$$w(z) = \begin{cases} w_k & , \quad for\ z < z_k \\ w_k\sqrt{1+[\alpha(z-z_k)]^2} & , \quad for\ z >= z_k \end{cases} \quad ; \quad \alpha = \frac{(\lambda / n_{eff})}{\pi w_o^{\ 2}}$$

where z is the longitudinal propagation position; w(z) is the z-dependent lateral position of the central line of the k^{th} gap; w_k is the position of the centre of the k^{th} gap at z=0; w_o is the beam waist at z=0; λ is the wavelength in vacuum, and n_{eff} is the effective index ~~and R is the radius of curvature of the phase front~~.

18. (currently amended) The optical coupler according to ~~any one of~~ claim 17, wherein the equations E2 include a linearised version and ~~other mathematical~~ polynomial approximation of the equations E2.

19. (original) An optical coupler comprising:

at least one input waveguide, a coupling region optically connected to said input waveguide; and

a plurality of output waveguides each optically connected to said coupling region, wherein said coupling region further comprises a plurality of coupled waveguides, at least some section of said coupled waveguides having a width that is less than a predetermined critical width at a predetermined wavelength at which said optical coupler is designed to operate.

20. (currently amended) The optical coupler according to ~~any one of~~ claim 19, wherein said coupled waveguides over at least another part of their lengths diverging with respect to each other in the propagation direction of electromagnetic radiation launched in the said input waveguide.

21. The optical coupler according to ~~any one of~~ claim 20, wherein centre lines of at least some of the gaps between the waveguides in a coupling region follow the lines of a Gaussian field in accordance with equations E1 as follows:

$$w(z) = w_k\sqrt{1+(\alpha z)^2} \quad ; \quad \alpha = \frac{(\lambda / n_{eff})}{\pi w_o^{\,2}} \quad ; \quad R = z\left(1+\left(\frac{1}{\alpha z}\right)^2\right)$$

where z is the longitudinal propagation position; w(z) is the z-dependent lateral position of the central line of the k^{th} gap; w_k is the position of the centre of the k^{th} gap at z=0; w_o is the beam waist at z=0; λ is the wavelength in vacuum, and n_{eff} is the effective index ~~and R is the radius of curvature of the phase front~~.

22. (currently amended) The optical coupler according to ~~any one of~~ claim 21, wherein the equations E1 include a linearised version and ~~other mathematical~~ polynomial approximation of the equations E1.

23. (currently amended) The optical coupler according to ~~any one of~~ claim 20, wherein the centre lines of a gap between the waveguides in the coupling region follow the lines of a field in accordance with equations E2 as follows:

$$w(z)=\begin{cases} w_k & , \quad for\ z<z_k \\ w_k\sqrt{1+[\alpha(z-z_k)]^2} & , \quad for\ z>=z_k \end{cases} \quad ; \quad \alpha=\frac{(\lambda/n_{eff})}{\pi w_o^{\ 2}}$$

where z is the longitudinal propagation position; w(z) is the z-dependent lateral position of the central line of the k^{th} gap; w_k is the position of the centre of the k^{th} gap at z=0; w_o is the beam waist at z=0; λ is the wavelength in vacuum, and n_{eff} is the effective index ~~and R is the radius of curvature of the phase front~~.

24. (currently amended) The optical coupler according to ~~any one of~~ claim 23, wherein the equations E2 include a linearised version and ~~other mathematical~~ polynomial approximation of the equations E2.